#7

SEQUENCE LISTING

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<120> VACCINES AND AGENTS FOR INDUCING IMMUNITY AGAINST RICKETTSIAL DISEASES, AND ASSOCIATED PREVENTATIVE THERAPY

<130> IDC01/60485/US

<140> US 09/677,374
<141> 2000-09-15

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<151> 1999-09-17

<150> NO 20004637
<151> 2000-09-15

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<150> GB 0022825.4
<151> 2000-09-18

<150> CL 2544-2000
<151> 2000-09-15

<160> 20

<170> PatentIn version 3.0

<210> 1
<211> 486
<212> DNA
<213> Piscirickettsia salmonis

<220>
<221> CDS
<222> (1)..(486)

<400> 1
atg aac aga gga tgt ttg caa ggt agt agt cta att att atc agt gtg 48
Met Asn Arg Gly Cys Leu Gln Gly Ser Ser Leu Ile Ile Ile Ser Val

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1               5                  10                  15

ttt tta gtt ggc tgt gcc cag aac ttt agt cgt caa gaa gtc gga gct 96
Phe Leu Val Gly Cys Ala Gln Asn Phe Ser Arg Gln Glu Val Gly Ala

            20                  25                  30

gcg act ggg gct gtt gtt ggc ggt gtt gct ggc cag ctg ttt ggt aaa 144
Ala Thr Gly Ala Val Val Gly Gly Val Ala Gly Gln Leu Phe Gly Lys

        35                  40                  45

ggt agt ggt cga gtt gca atg gcc att ggt ggt gct gtt ttg ggt gga 192
Gly Ser Gly Arg Val Ala Met Ala Ile Gly Gly Ala Val Leu Gly Gly

    50                  55                  60

tta att ggt tct aaa atc ggt caa tcg atg gat cag cag gat aaa ata 240
Leu Ile Gly Ser Lys Ile Gly Gln Ser Met Asp Gln Gln Asp Lys Ile

65                  70                  75                  80

aag cta aac cag agt ttg gaa aag gta aaa gca ggg caa gtg aca cgt 288
Lys Leu Asn Gln Ser Leu Glu Lys Val Lys Ala Gly Gln Val Thr Arg

                85                  90                  95

tgg cgt aat cca gat aca ggc aat agt tat agt gtt gag cca gtg cgt 336
Trp Arg Asn Pro Asp Thr Gly Asn Ser Tyr Ser Val Glu Pro Val Arg

            100                 105                 110

act tac cag cgt tac aat aag caa gag cgt cgc cag caa tat tgt cga 384
Thr Tyr Gln Arg Tyr Asn Lys Gln Glu Arg Arg Gln Gln Tyr Cys Arg

        115                 120                 125

gaa ttt cag caa aag gcg atg att gca ggg cag aag caa gag att tac 432
Glu Phe Gln Gln Lys Ala Met Ile Ala Gly Gln Lys Gln Glu Ile Tyr
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130 135 140

ggc act gca tgc cgg caa ccg gat ggt cgt tgg caa gtc att tca aca 480
Gly Thr Ala Cys Arg Gln Pro Asp Gly Arg Trp Gln Val Ile Ser Thr

145 150 155 160

gaa aaa 486
Glu Lys

<210> 2
<211> 162
<212> PRT
<213> Piscirickettsia salmonis

<400> 2

Met Asn Arg Gly Cys Leu Gln Gly Ser Ser Leu Ile Ile Ile Ser Val
1 5 10 15

Phe Leu Val Gly Cys Ala Gln Asn Phe Ser Arg Gln Glu Val Gly Ala
20 25 30

Ala Thr Gly Ala Val Val Gly Gly Val Ala Gly Gln Leu Phe Gly Lys
35 40 45

Gly Ser Gly Arg Val Ala Met Ala Ile Gly Gly Ala Val Leu Gly Gly
50 55 60

Leu Ile Gly Ser Lys Ile Gly Gln Ser Met Asp Gln Gln Asp Lys Ile
65 70 75 80

Lys Leu Asn Gln Ser Leu Glu Lys Val Lys Ala Gly Gln Val Thr Arg
85 90 95

Trp Arg Asn Pro Asp Thr Gly Asn Ser Tyr Ser Val Glu Pro Val Arg
100 105 110

Thr Tyr Gln Arg Tyr Asn Lys Gln Glu Arg Arg Gln Gln Tyr Cys Arg
115 120 125

Glu Phe Gln Gln Lys Ala Met Ile Ala Gly Gln Lys Gln Glu Ile Tyr

130 135 140

Gly Thr Ala Cys Arg Gln Pro Asp Gly Arg Trp Gln Val Ile Ser Thr
145 150 155 160

Glu Lys

<210> 3
<211> 483
<212> DNA
<213> Piscirickettsia salmonis

<220>
<221> CDS
<222> (1)..(483)

<400> 3
atg cgt ggt tgc ctg cag ggc agc tct ctg atc att atc tct gtt ttc 48
Met Arg Gly Cys Leu Gln Gly Ser Ser Leu Ile Ile Ile Ser Val Phe

1 5 10 15

ctg gtg ggt tgc gcc cag aac ttc agc cgc cag gaa gtt ggc gcg gcc 96
Leu Val Gly Cys Ala Gln Asn Phe Ser Arg Gln Glu Val Gly Ala Ala

20 25 30

acc ggt gcg gtt gtg ggc ggt gtt gcc ggc cag ctg ttc ggt aaa ggc 144
Thr Gly Ala Val Val Gly Gly Val Ala Gly Gln Leu Phe Gly Lys Gly

35 40 45

tct ggt cgt gtg tcg atg gcc atc ggc ggt gcg gtt ctg ggc ggt ctg 192
Ser Gly Arg Val Ser Met Ala Ile Gly Gly Ala Val Leu Gly Gly Leu

50 55 60

att ggc tct aaa atc ggt cag agc atg gac cag cag gat aaa atc aaa 240
Ile Gly Ser Lys Ile Gly Gln Ser Met Asp Gln Gln Asp Lys Ile Lys

65 70 75 80

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ctg aac cag tct ctg gaa aaa gtg aaa gcc ggc cag gtt act cgt tgg 288
Leu Asn Gln Ser Leu Glu Lys Val Lys Ala Gly Gln Val Thr Arg Trp

                85                  90                  95

cgt aat ccg gac acc ggt aac agc tac tct gtg gaa ccg gtt cgc acc 336
Arg Asn Pro Asp Thr Gly Asn Ser Tyr Ser Val Glu Pro Val Arg Thr

            100                 105                 110

tac cag cgt tac aac aaa cag gaa cgc cgt cag cag tac tgc cgc gaa 384
Tyr Gln Arg Tyr Asn Lys Gln Glu Arg Arg Gln Gln Tyr Cys Arg Glu

        115                 120                 125

ttt cag cag aaa gcc atg atc gca ggt cag aaa cag gaa atc tac ggc 432
Phe Gln Gln Lys Ala Met Ile Ala Gly Gln Lys Gln Glu Ile Tyr Gly

    130                 135                 140

acc gcg tgc cct cag ccg gat ggc cgc tgg cag gtg att agc acc gaa 480
Thr Ala Cys Pro Gln Pro Asp Gly Arg Trp Gln Val Ile Ser Thr Glu

145                 150                 155                 160

aaa                                                         483
Lys
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<210> 4
<211> 161
<212> PRT
<213> Piscirickettsia salmonis

<400> 4

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Met Arg Gly Cys Leu Gln Gly Ser Ser Leu Ile Ile Ile Ser Val Phe
1               5                  10                  15
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Leu Val Gly Cys Ala Gln Asn Phe Ser Arg Gln Glu Val Gly Ala Ala
            20                  25                  30

Thr Gly Ala Val Val Gly Gly Val Ala Gly Gln Leu Phe Gly Lys Gly
        35                  40                  45

Ser Gly Arg Val Ser Met Ala Ile Gly Gly Ala Val Leu Gly Gly Leu
    50                  55                  60

Ile Gly Ser Lys Ile Gly Gln Ser Met Asp Gln Gln Asp Lys Ile Lys
65                  70                  75                  80

Leu Asn Gln Ser Leu Glu Lys Val Lys Ala Gly Gln Val Thr Arg Trp
                85                  90                  95

Arg Asn Pro Asp Thr Gly Asn Ser Tyr Ser Val Glu Pro Val Arg Thr
            100                 105                 110

Tyr Gln Arg Tyr Asn Lys Gln Glu Arg Arg Gln Gln Tyr Cys Arg Glu
        115                 120                 125

Phe Gln Gln Lys Ala Met Ile Ala Gly Gln Lys Gln Glu Ile Tyr Gly
    130                 135                 140

Thr Ala Cys Pro Gln Pro Asp Gly Arg Trp Gln Val Ile Ser Thr Glu
145                 150                 155                 160

Lys
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<210> 5
<211> 768
<212> DNA
<213> Piscirickettsia salmonis

<220>
<221> CDS
<222> (1)..(768)

<220>
<221> sig_peptide
<222> (1)..(285)

<220>
<221> mat_peptide
<222> (286)..(768)

<400> 5

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atg tca gtt gaa ttc tac aac tct aac aaa tca gca caa aca aac tca 48
Met Ser Val Glu Phe Tyr Asn Ser Asn Lys Ser Ala Gln Thr Asn Ser

-95                 -90                 -85                 -80

att aca cca ata atc aaa att act aac aca tct gac agt gat tta aat 96
Ile Thr Pro Ile Ile Lys Ile Thr Asn Thr Ser Asp Ser Asp Leu Asn

                -75                 -70                 -65

tta aat gac gta aaa gtt aga tat tat tac aca agt gat ggt aca caa 144
Leu Asn Asp Val Lys Val Arg Tyr Tyr Tyr Thr Ser Asp Gly Thr Gln

            -60                 -55                 -50

gga caa act ttc tgg tgt gac cat gct ggt gca tta tta gga aat agc 192
Gly Gln Thr Phe Trp Cys Asp His Ala Gly Ala Leu Leu Gly Asn Ser

        -45                 -40                 -35

tat gtt gat aac act agc aaa gtg aca gca aac ttc gtt aaa gaa aca 240
Tyr Val Asp Asn Thr Ser Lys Val Thr Ala Asn Phe Val Lys Glu Thr

    -30                 -25                 -20

gca agc cca aca tca acc tat gat aca tat ctg gat ccg tct cat atg 288
Ala Ser Pro Thr Ser Thr Tyr Asp Thr Tyr Leu Asp Pro Ser His Met

-15                 -10                 -5                  1

cgt ggt tgc ctg cag ggc agc tct ctg atc att atc tct gtt ttc ctg 336
Arg Gly Cys Leu Gln Gly Ser Ser Leu Ile Ile Ile Ser Val Phe Leu

            5                   10                  15

gtg ggt tgc gcc cag aac ttc agc cgc cag gaa gtt ggc gcg gcc acc 384
Val Gly Cys Ala Gln Asn Phe Ser Arg Gln Glu Val Gly Ala Ala Thr

        20                  25                  30
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ggt gcg gtt gtg ggc ggt gtt gcc ggc cag ctg ttc ggt aaa ggc tct 432
Gly Ala Val Val Gly Gly Val Ala Gly Gln Leu Phe Gly Lys Gly Ser

    35                  40                  45

ggt cgt gtg tcg atg gcc atc ggc ggt gcg gtt ctg ggc ggt ctg att 480
Gly Arg Val Ser Met Ala Ile Gly Gly Ala Val Leu Gly Gly Leu Ile

50                  55                  60                  65

ggc tct aaa atc ggt cag agc atg gac cag cag gat aaa atc aaa ctg 528
Gly Ser Lys Ile Gly Gln Ser Met Asp Gln Gln Asp Lys Ile Lys Leu

                70                  75                  80

aac cag tct ctg gaa aaa gtg aaa gcc ggc cag gtt act cgt tgg cgt 576
Asn Gln Ser Leu Glu Lys Val Lys Ala Gly Gln Val Thr Arg Trp Arg

            85                  90                  95

aat ccg gac acc ggt aac agc tac tct gtg gaa ccg gtt cgc acc tac 624
Asn Pro Asp Thr Gly Asn Ser Tyr Ser Val Glu Pro Val Arg Thr Tyr

        100                 105                 110

cag cgt tac aac aaa cag gaa cgc cgt cag cag tac tgc cgc gaa ttt 672
Gln Arg Tyr Asn Lys Gln Glu Arg Arg Gln Gln Tyr Cys Arg Glu Phe

    115                 120                 125

cag cag aaa gcc atg atc gca ggt cag aaa cag gaa atc tac ggc acc 720
Gln Gln Lys Ala Met Ile Ala Gly Gln Lys Gln Glu Ile Tyr Gly Thr

130                 135                 140                 145

gcg tgc cct cag ccg gat ggc cgc tgg cag gtg att agc acc gaa aaa 768
Ala Cys Pro Gln Pro Asp Gly Arg Trp Gln Val Ile Ser Thr Glu Lys

                150                 155                 160
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<210> 6
<211> 256
<212> PRT
<213> Piscirickettsia salmonis

<220>
<221> SIGNAL
<222> (-95)..(-1)

<400> 6

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-95                 -90                 -85                 -80

Ile Thr Pro Ile Ile Lys Ile Thr Asn Thr Ser Asp Ser Asp Leu Asn
                -75                 -70                 -65

Leu Asn Asp Val Lys Val Arg Tyr Tyr Tyr Thr Ser Asp Gly Thr Gln
            -60                 -55                 -50

Gly Gln Thr Phe Trp Cys Asp His Ala Gly Ala Leu Leu Gly Asn Ser
        -45                 -40                 -35

Tyr Val Asp Asn Thr Ser Lys Val Thr Ala Asn Phe Val Lys Glu Thr
    -30                 -25                 -20

Ala Ser Pro Thr Ser Thr Tyr Asp Thr Tyr Leu Asp Pro Ser His Met
-15                 -10                 -5                  1

Arg Gly Cys Leu Gln Gly Ser Ser Leu Ile Ile Ile Ser Val Phe Leu
            5                   10                  15

Val Gly Cys Ala Gln Asn Phe Ser Arg Gln Glu Val Gly Ala Ala Thr
        20                  25                  30

Gly Ala Val Val Gly Gly Val Ala Gly Gln Leu Phe Gly Lys Gly Ser
    35                  40                  45

Gly Arg Val Ser Met Ala Ile Gly Gly Ala Val Leu Gly Gly Leu Ile
50                  55                  60                  65

Gly Ser Lys Ile Gly Gln Ser Met Asp Gln Gln Asp Lys Ile Lys Leu
                70                  75                  80

Asn Gln Ser Leu Glu Lys Val Lys Ala Gly Gln Val Thr Arg Trp Arg
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85 90 95

Asn Pro Asp Thr Gly Asn Ser Tyr Ser Val Glu Pro Val Arg Thr Tyr
100 105 110

Gln Arg Tyr Asn Lys Gln Glu Arg Arg Gln Gln Tyr Cys Arg Glu Phe
115 120 125

Gln Gln Lys Ala Met Ile Ala Gly Gln Lys Gln Glu Ile Tyr Gly Thr
130 135 140 145

Ala Cys Pro Gln Pro Asp Gly Arg Trp Gln Val Ile Ser Thr Glu Lys
150 155 160

<210> 7
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 7
gagagaacat atgaacagag gatgtttgca agg 33

<210> 8
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 8
gccataagct cttccgcatt tttctgttga aatgacttgc 40

<210> 9
<211> 111
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 9

cgccagggtt ttcccagtca cgacggatcc gtctcatatg cgtggttgcc 50

tgcagggcag ctctctgatc attatctctg ttttcctggt gggttgcgcc 100

cagaacttca g 111

<210> 10
<211> 110
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 10
tgggttgcgc ccagaacttc agccgccagg aagttggcgc ggccaccggt 50

gcggttgtgg gcggtgttgc cggccagctg ttcggtaaag gctctggtcg 100

tgtggcgatg 110

<210> 11
<211> 94
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 11
aaaggctctg gtcgtgtggc gatggccatc ggcggtgcgg ttctgggcgg 50

tctgattggc tctaaaatcg gtcagagcat ggaccagcag gata 94
94

<210> 12
<211> 118
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 12
gttccacaga gtagctgtta ccggtgtccg gattacgcca acgagtaacc 50

tggccggctt tcacttttc cagagactgg ttcagtttga ttttatcctg 110

ctggtccatg ctctgacc 118

<210> 13
<211> 102
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 13
ggtgccgtag atttcctgtt tctgacctgc gatcatggct ttctgctgaa 50

attcgcggca gtactgctga cggcgttcct gtttgttgta acgctggtag gt 102
102

<210> 14
<211> 110
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: primer

<400> 14
cgtcctctcg tcctggtccg aattcagata agcttatttt tcggtgctaa 50

tcacctgcca gcggccatcc ggctgacggc acgcggtgcc gtagatttcc 100

tgtttctgac 110

<210> 15
<211> 10
<212> PRT
<213> Piscirickettsia salmonis

<400> 15

Pro Val Arg Thr Tyr Gln Arg Tyr Asn Lys
1 5 10

<210> 16

<211> 20
<212> PRT
<213> Piscirickettsia salmonis

<400> 16

Pro Val Arg Thr Tyr Gln Arg Tyr Asn Lys Gln Glu Arg Arg Gln Gln
1 5 10 15

Tyr Cys Arg Glu
20

<210> 17
<211> 118
<212> DNA
<213> Clostridium tetani

<220>
<221> CDS
<222> (41)..(91)

<220>
<221> mat_peptide
<222> (41)..(85)

<400> 17
cgccagggtt ttcccagtca cgacggatcc gtctcatatg cag tac att 49
Gln Tyr Ile

aaa gca aac tct aaa ttc atc ggt att acc gaa ctg att aat 91
Lys Ala Asn Ser Lys Phe Ile Gly Ile Thr Glu Leu Ile Asn
5 10 15

taagcttcgg accaggacga gaggacg 118

<210> 18
<211> 118
<212> DNA
<213> Morbillivirus measles virus

<220>
<221> CDS
<222> (41)..(91)

<220>

<221> mat_peptide
<222> (41)..(85)

<400> 18
cgccagggtt ttcccagtca cgacggatcc gtctcatatg ctg tct gaa 49
Leu Ser Glu

atc aaa ggt gtt atc gtt cat cgt ctg gaa ggc gtg att aat 91
Ile Lys Gly Val Ile Val His Arg Leu Glu Gly Val Ile Asn
5 10 15

taagcttcgg accaggacga gaggacg 118

<210> 19
<211> 15
<212> PRT
<213> Clostridium tetani

<400> 19

Gln Tyr Ile Lys Ala Asn Ser Lys Phe Ile Gly Ile Thr Glu Leu
1 5 10 15

<210> 20
<211> 15
<212> PRT
<213> Morbillivirus measles virus

<400> 20

Leu Ser Glu Ile Lys Gly Val Ile Val His Arg Leu Glu Gly Val
1 5 10 15